

GEOLOGY ALUMNI ENDOWED AWARD



2019 IMPACT REPORT



The Geology Alumni Endowed Award

was established in the School of Sciences and Mathematics in 2016 with gifts from Karen Black '10, Mike Passarello '08, and Emily Sekula '05. The award was established to enable undergraduate Geology and Environmental Geosciences students to participate in hands-on academic opportunities that will facilitate their post-graduate and career goals. The alumni donors aim to motivate others to support the initiative because of their transformational undergraduate experiences at the College.

AREAS OF IMPACT

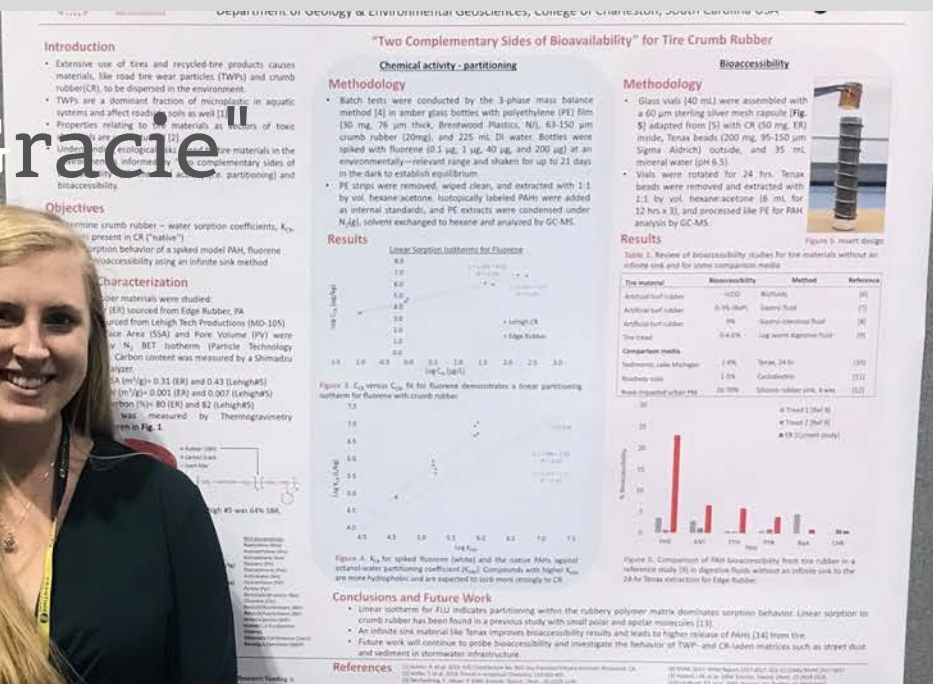
- **Undergraduate Research**
- **Field Studies**
- **Career Development**

including travel to professional conferences

2019 RECIPIENT

Catherine "Gracie" Eldridge '20

Hometown:
Prosperity, South Carolina



Research: Sorption Behavior of Polycyclic Aromatic Hydro- carbons to Tire Materials

Advisor:
Barbara
Beckingham

Plastic polymers frequently found in the environment can range from polyethylene in abrasive cosmetics, to nylon in textile materials, to polybutadiene in tires. Their sizes vary from macroplastics, particles or fibers >5mm in size, all the way down to microplastics, <5mm. The particular combination of microplastics' size and the polymers' tendencies to sorb poorly water-soluble chemicals generates a viable vector to introduce toxic compounds into the water column and potentially to organisms that inadvertently consume them. Because tire wear particles are likely a dominant type of microplastic emitted into the Charleston Harbor, and PAHs are a common urban contaminant associated with combustion and tire material, we have chosen this as a model system to study how chemicals distribute between water and tire wear particles.

Understanding this relationship led us to conducting two complementary bioavailability experiments: chemical activity partitioning and bioaccessibility. Chemical activity utilized a pre-calibrated polyethylene passive sampler to observe equilibrium concentrations of tire particles and water at varying PAH spike concentrations. The bioaccessibility experiment involved and used a sink method, TENAX, to measure the concentration of PAHs desorbing from tire particles during a 24 hour period. Our results have shown that partitioning within tires' rubbery matrix dominates sorption while providing data to predict the chemical activity of other PAHs not tested in this research. The results have also revealed that the concentrations of rapidly available PAHs may be larger than previously determined.

The knowledge and opportunities that I have gained from undergraduate research have far exceeded my expectations. From fostering close relationships with my professors to presenting at an international conference, this has truly been an experience I will always be grateful for.

2019 RECIPIENT



Clara Meier

'20

Hometown:

Washington, D.C.

Research:

**Was
Massive
Volcanism
Responsible
for the
Rapid
Climate
Change and
Extinction
in the Early
Cenozoic?**

Advisor:

Teddy Them

This past summer I was afforded numerous research opportunities that took me across the country to pursue my passion for Geology. Starting in May, I flew across the country with 10 of my fellow Geology peers and two professors from College of Charleston to complete a Field Studies camp based in Taos, NM. For three weeks I was able to apply everything I had learned in my classes for the past three years in the field. From Mt. Wheeler in Taos to the Great National Sand Dunes in Colorado to Arches, Utah, my team reconstructed the entire geological history of the Colorado Plateau.

My last stint of the summer landed me in the vast, wild state of Alaska - the final frontier. It had long been a dream of mine to go to Alaska and this visit surpassed my expectations. I was afforded the opportunity to conduct field work alongside my professor, Dr. Theodore Them, and his esteemed research team in the Wrangell-St. Elias National Park and Preserve. For eight nights we camped in the backcountry of this wholly uninhabited landscape with the goal of describing the rest of a rock section, which comprised an entire mountain, that Dr. Them and his colleagues had worked on in previous years. The section, Grotto Creek, contains the boundary between the Triassic and Jurassic, which is associated with one of the five largest mass extinction events. I spent much of the time with the geochemists collecting rock samples that will later be analyzed back in their respective laboratories. When I wasn't working on rock samples, I was fossil hunting for ammonites which are part of the phylum cephalopoda and serve as a good index fossil. I cannot emphasize enough how incredibly honored I am to have gained so much research and fieldwork experience as an undergraduate student. It is one of the best qualities of the Department of Geology at CofC.

2019 RECIPIENT

Shannon Ware

'20

Hometown:

Moncks Corner, South Carolina



Shannon Ware, left, and Veronica Gordon, visiting student from Brown University.

Research:
**Active and
Passive
Treatment
of Water in
Stormwater
Retention
Ponds**

Advisor:
Vijay Vulava

For our research last summer, we wanted to study the impact that oyster populations could have on polluted water systems, specifically their ability to reduce nutrient levels in the water. Oysters are natural filter feeders and are able to filter out contaminants in water and incorporate them either into their shell or expel it as feces. In order to study their impact on nutrient levels, we conducted filtration experiments by placing oysters (donated by the Charleston Oyster Farm) into 5 gallon buckets containing polluted water for 3 hours. Then, we compared the nutrient levels in polluted water with oyster filtration against the nutrient levels in polluted water that had no filtration (our control). All of our experiments were conducted at CofC's Stono Preserve with our sampling water taken from one of the ponds.

Our results show that the average phosphorus concentrations and also the turbidity of the water was significantly decreased due to oyster filtration, but that the average nitrogen levels were generally unaffected. Through our research, we were able to not only prove that oyster populations can have a positive impact on water quality, but we were also able to contribute to the ongoing research conducted to study if oysters are a viable method to clean up our waterways. We are continuing our research by analyzing the influence that polluted water can have on oyster populations, including their filtration abilities and also the heavy metal accumulation in their soft tissue and shell.



PREVIOUS AWARD RECIPIENTS

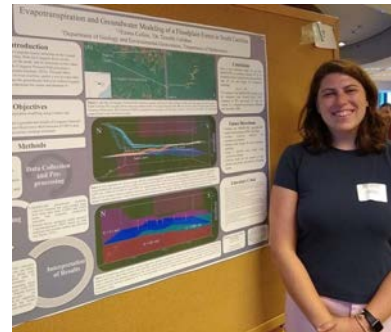
Emanuel "Manny" Byas '19

Current Position: Hydrographer with Fugro, Houston, Texas



Emma Collins '18

Current Position: Research Associate with Robinson Design Engineers, Charleston



Michael Shahin '18

Current Position: PhD student in Glaciology, University of Kansas



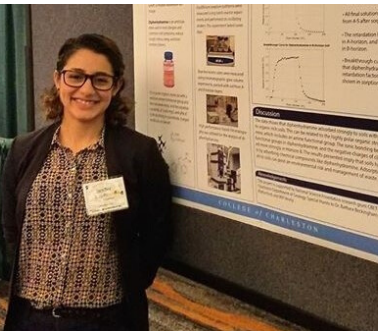
Hana Mintz '18

Current Position: Technician with Mercedes-Benz Vans, Summerville, South Carolina



Jeniffer Soto Perez '18

Current Position: Hydrology Technician with U.S. Geological Survey, Sacramento, California



G. Brad Thompson '18

Current Position: M.S. Environmental Studies student, College of Charleston



2018

2017

FINANCIAL OVERVIEW

Matching gift pledges expected by April 2020

\$52,500

\$35,500

Left to reach \$300,000 goal

\$212,000

Fund balance as of December 1, 2019

\$12,750

Projected annual income after reaching \$300,000 endowment balance

THANK YOU

Since the fund was established in 2016, the Geology Alumni Endowed Award has received gifts totaling nearly \$180,000 from the following donors. Thank you for supporting Geology at the College of Charleston!

Individual Donors

Morgan Annab '13
Paul Bergstrand '85
Karen Black '10
Tim Callahan
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Timmon Drumm '09
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Chris Ginn '11
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Stacey Hassard
Brittney Marshall-Kesser '09
Robin McLachlan '14
Robert Nusbaum
Siobhan O'Reilly-Shah '02
David Osorio
Harris Pantlik '11
Mike Passarello '08
Antoinette Reale '01
Emily Sekula '05
Jacqueline Smith
Mary Thompson '10
Kelly Tomlinson '10
Peter Zink

Corporate and Foundation Support

Anadarko Petroleum
Apache Corporation
Exxon Mobil Foundation
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Geology Alumni at the 2018 Reunion

"Giving back to the Geology Department is a small way of recognizing that my graduate school and professional journey are largely due to the educational and research opportunities that I was able to pursue while attending the College.

I give in order to honor the department's commitment to each and every student, and it is my hope that others will have similar opportunities that will ultimately lead them to achieve their full potential."

Mike Passarello '08, Geology Board of Advocates Chair